

The Learning Process in Cultural of Fourth Industrial Revolution 4.0 (4IR)*

El proceso de aprendizaje en cultura de la cuarta revolución industrial 4.0 (4IR)

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ABSTRACT

This study is focus to emergence of a new technology known as ‘The Fourth Industrial Revolution’ or the Industrial Revolution 4.0 has led to the current development of technology that predicts 50 billion electronic devices will interact with each other. Meeting the challenges of the Industrial Revolution 4.0, all students at the Institute of Higher Education (IPT) need to be prepared with this new era. Accordingly, a study was conducted on 30 students of the Faculty of Information Science and Technology (FTSM) Universiti Kebangsaan Malaysia (UKM) in Bangi, Selangor. This study aims to identify the level of knowledge, willingness and skills among students to pursue the Challenge of Industrial Revolution 4.0. This research is a descriptive study which use Likert scale. The data was analyzed using SPSS software. The findings show that the students’ knowledge level towards the Industrial Revolution 4.0 is at a moderate level. Meanwhile, the study also found that student readiness was at moderate level. The findings also found that the skills level towards the Industrial Revolution 4.0 is at a moderate level. Researchers suggest that students should focus on maintaining the identity, sustainability of the mind, culture and the identity of students in the face of the new National Development and Transformation Plan 2050. Students need to get out of the habit and master the 4C elements of Critical Thinking & Problem Solving, Communication, Collaboration and Creativity.

Keywords: 4IR, Culture, Revolution.

RESUMEN

Este estudio enfocado al surgimiento de una nueva tecnología conocida como ‘La Cuarta Revolución Industrial’ o la Revolución Industrial 4.0 ha llevado al desarrollo actual de tecnología que predice que 50 mil millones de dispositivos electrónicos interactuarán entre sí. Al enfrentar los desafíos de la Revolución Industrial 4.0, todos los estudiantes del Instituto de Educación Superior (IPT) deben estar preparados para esta nueva era. En consecuencia, se realizó un estudio en 30 estudiantes de la Facultad de Ciencias de la Información y Tecnología (FTSM) Universiti Kebangsaan Malaysia (UKM) en Bangi, Selangor. Este estudio tiene como objetivo identificar el nivel de conocimiento, disposición y habilidades entre los estudiantes para perseguir el Desafío de la Revolución Industrial 4.0. Esta investigación es un estudio descriptivo que utiliza la escala Likert. Los datos se analizaron utilizando el software SPSS. Los resultados muestran que el nivel de conocimiento de los estudiantes hacia la Revolución Industrial 4.0 está en un nivel moderado. Mientras tanto, el estudio también encontró que la preparación de los estudiantes estaba en un nivel moderado. Los resultados también encontraron que el nivel de habilidades hacia la Revolución Industrial 4.0 está en un nivel moderado. Los investigadores sugieren que los estudiantes deben centrarse en mantener la identidad, la sostenibilidad de la mente, la cultura y la identidad de los estudiantes frente al nuevo Plan Nacional de Desarrollo y Transformación 2050. Los estudiantes deben salir del hábito y dominar los elementos 4C de Critical Pensamiento y resolución de problemas, comunicación, colaboración y creatividad.

Palabras clave: 4IR, Cultura, Revolución.

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INTRODUCTION

The 4IR have been announced during the presentation of Budget 2018 and been highlighted rapidly due to tremendous movement on technology. Historically, over 25 years since Sir Timothy John Berners-Lee created the World Wide Web, the internet has become part of the daily life of not only social, but also economic and political development. The Industrial Revolution 4.0 (IR 4.0) is now widely spoken around the world. The emergence of a new technological wave known as ‘The Fourth Industrial Revolution’ or the Industrial Revolution 4.0 (Industry 4.0) and the era of ‘Digital Economy’ or the Digital Economy led the government to continue to work towards the success of the Malaysian Digital Policy. History states that the first Industrial Revolution (RP) 1760 – 1830 referred to the use of water or steam technology capable of moving machinery. The next technological development involved electrical forces that triggered the second RP around 1870 - 1914. The third RP began at the end of the 20th century through information or digital technology. Now the world is said to have entered RP 4.0 phase.

Therefore, Malaysia as a development country was working hard on research about the readiness of Malaysian citizen to face out 4IR revolution. This phenomena included UKM that move forward into 4IR. UKM analyze 4IR as one of agenda that need to be implanted in the University to cope with government need and industrial development. Therefore, prefect preparation from all sectors needs to be done due to the development of current technology. It was in line with the higher education transformation of the Malaysian Education Development Plan (Higher Education). In addition, the teaching methods that accompany the Industrial Revolution 4.0 should be widely practiced.

Hence, PwC (2017) believed that the emergence of a cyber-physical system involving fully new capabilities for humans, machines and new methods of technology. In other words, automation technology is seen as a technology capability that does not require human involvement.

Therefore this preliminary study was to examine the student’s readiness, knowledge and challenges about IR 4.0. The outcomes in this study will be help the University to come out with an appropriate framework to suit students’ needs and diversify the pedagogy that integrate and blended with the technology.

METHOD

In this qualitative study, the questionnaire with likert scale have been used. The likert scale consists of 5 level of agreement which is Strongly Agree (SS) to Strongly Disagree (STS). The 5 options are “Strongly Disagree”, “Disagree”, “Neutral”, “Agree”, “Strongly Agree.” Furthermore, the questionnaire consists of four sections, Part A, Part B, Part C, and Part D. Part A is about the background of respondents with items such as name, age, and race. Part B contains 10 items relating to students’ level of knowledge of the Industrial Revolution 4.0. Whereas section C is about students’ readiness level facing the challenges of Industrial Revolution 4.0 and has 10 themed items. Part D contains 10 items containing questions related to students’ level of competence in the 4th Industrial Revolution. The data obtained from this study were analyzed using SPSS software and supplemented by the findings

There are 30 respondent within the ages of 19 and above have been selected using simple sampling method to obtain the empirical data. All the respondent were the student from Faculty of Technology and Information Sciences, National University of Malaysia from various programs offered such as Bachelor of Computer Science, Bachelor of Information Technology, Bachelor of Software Engineering (Information System Development) and Bachelor of Software Engineering (Multimedia System Development).

RESULTS AND DISCUSSION

A total of 30 respondents involve in this study and all of them consists of student from Faculty of Technology and Science, Information (FTSM), National University of Malaysia.

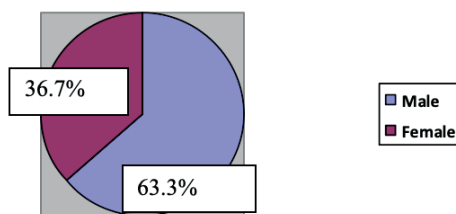


Figure 1.1 Distribution of respondent based on gender

Figure 1.1 above shows the pie chart of the respondents based on gender. There were 63.3 % respondent were male whereby 36.7% were female. From this number of students as the respondent a total of 15 students (50%) were 22 years old, 9 students (30%) 21 years old, 3 students (10%) 20 years old and 3 students (10%) 19 years old whom consists of which 19 (63.3%) were Malay, 9 (26.7%) were Chinese, 1 (3.3%) was Indian and 2 were (6.7%) of other nationalities.

Student's Knowledge Regarding 4IR

Bil	Items	Min	Standard Deviation
1	I have heard about Industrial Revolution (4IR).	4.0667	1.31131
2	I understand and able to explain the meaning of IR 4.0.	3.8000	1.12648
3	I really understand about IR 4.0 especially about Internet of Things, Cloud, Big Data and others.	3.6667	1.12444
4	Industrial Revolution 4.0 is a digital economic that make life easier.	4.1333	0.86037
5	This revolution is the emergence of cyber system that involves technology but do not need to involve humans directly.	3.8000	1.15669
6	The Industrial Revolution able to solve the problem in human resource.	3.9333	0.90719
7	I am do not interested about 4IR	2.8333	1.44039
8	The Industrial Revolution 4.0 was more about allowing robots to rely on human resources.	3.8000	1.09545
9	I am really interested in hiring more about the Revolution Industry 4.0	4.2667	0.86834
10	Education 4.0 have been adapted in IR 4.0. Do you know about this? Ask about this?	3.6000	1.37966

Table 1.1 Student's Knowledge Regarding 4.0 IR

From above table, it indicated that student knowledge score higher on item no 1 with min (4.0667) and that show that most of the student in this study know about 4IR. However the lowest score was the item no 7 with min 2.8333. It indicated that most of respondents didn't agree with that item. The highest score was item no 9 with min 4.2667 and that shown that respondent really interested regarding 4IR.

Student's readiness toward challenges in IR 4.0

Bil	Items	Min	Standard Deviation
1	I understood about the challenges in IR 4.0 era's	3.8667	1.33218
2	I ready to face up IR 4.0 era's	3.8000	1.09545
3	I have a lot of expose on IR 4.0	3.7333	0.82768
4	The University provide a platform for students to meet this challenge of IR 4.0	4.1000	1.12495
5	The Students need to out of the comfort zone to lead the IR 4.0	4.0667	0.78492
6	Creative and innovative are needed to meet this challenge IR 4.0	4.1000	0.95953
7	IR 4.0 was a threat to the student's especially to the lower secondary school in job opportunity	4.0000	1.01710
8	Student didn't take their own initiative to improve themselves in preparation for the IR 4.0	3.8333	1.14721
9	The University by itself was less in implementing the latest technology in learning.	3.6333	1.03335
10	I feel that IR 4.0 was a treat	3.3000	1.39333

Table 1.2 student's readiness towards IR .40

Table 1.2 above shows the level of student readiness towards the Industrial Revolution 4.0. The findings show that the highest level of student readiness 'The University provides a great platform for students to meet the challenges of the Industrial Revolution 4.0' and the item 6 regarding the creative and innovative that need to meet the challenges of IR 4.0 with the 4.1000 mean score which means that most respondents agree with both item. The lowest mean is 3.3000 which is in the question 'I feel Industrial Revolution 4.0 is a threat' where respondents still express their agreement. In conclusion, most students are not yet ready to face the challenges of the Industrial Revolution 4.0.

Student's proficiency in IR 4.0

Bil	Items	Min	Standard Deviation
1	I believed I have enough to go through IR 4.0	4.0333	1.18855
2	Communication skill on speaking and writing needed in IR 4.0	4.0667	0.86834
3	Student had a problem in English face a problem in IR 4.0	3.9333	1.08066

4	Student have to increase their proficiency to be more competence with robot.	3.8667	0.97320
5	Conflict analysis skill needed in IR 4.0 era's to overcome the problem quickly.	4.0333	0.99943
6	Cognitive skill needed in IR 4.0 era to overcome complex issue with aggressively and holistic.	3.9333	0.90719
7	'The skills of emotional control are important for social and professional management because IR 4.0 not just about robots.	4.2333	0.93526
8	I will left behind in IR 4.0 era's if I didn't increase my skills.	4.0000	0.83045
9	The University provide a platform for me to increase my skill on IR 4.0	3.7667	1.25075
10	I attended the courses or seminar to increase my knowledge and skill in IR 4.0	3.6667	0.99424

Table 1.3 Student proficiency on IR 4.0

Table 1.3 above shows the level of proficiency of students facing the Industrial Revolution 4.0. The findings of the study show that the highest level of students' skills is on the question 'The skills of emotional control are important for social and professional management because Industrial Revolution 4.0 is not just about robots.' min 4.2333 where most respondents agree that emotional skills are very important because in the real world, more personality can be seen especially in the workplace. While the highest percentage of strongly disagree was 6.7% with 3 people on the question 'I believe I have enough skills to go through the Industrial Revolution 4.0'. The highest mean was 4.2333 where most respondents strongly agreed with the above statement of emotional skills. The lowest mean was 3.6667 on the question 'I attend to courses or seminars to increase my knowledge and skills in the face of the Industrial Revolution 4.0' where respondents still agreed to this statement. Concluding these 3 objectives, students' skills are still at a moderate level in preparing for the industrial revolution 4.0.

CONCLUSIONS

According to the founder of the World Economic Forum, Klaus Schwab in his book *The Fourth Industrial Revolution* marked by the emergence of supercomputers, smart robots, driverless vehicles, genetic modifications and the development of terotechnology that enable humans to better optimize brain function. In other words, human life will be simplified with the help of robots becoming "friends" who will manage the day-to-day affairs and tasks of humans.

The results show that students of the Faculty of Information Science (FTSM) are in line with the development of the Industrial Revolution 4.0. However, there are some students from FTSM who know about the Industrial Revolution 4.0 but they are unable to explain the elements of the Industrial Revolution 4.0. FTSM students need to be equipped with knowledge in the areas of information technology, software engineering, entrepreneurship, communication as well as religious knowledge in order to produce outstanding graduates and be prepared to face a more complex environment in the wake of the Industrial Revolution 4.0 wave.

Suggestion

The current education system does not work in accordance with the philosophy of education and should be changed to a better system. However, there is no need to seek a new educational vision as our educational philosophy is well-prepared to address any challenges but we do not use and refer to that philosophy when designing and implementing educational programs. For example, we are increasing the number of classes that are guided by digital technologies that are more interactive and flexible.

Responsible educators need to be actively introducing new courses in line with the industrial revolution 4.0 based on creative and innovative thinking. These courses will greatly help students to know about the fast-growing 4.0 industry around the world. By gaining an in-depth knowledge of the programs or courses offered by the university, students can transform themselves to better prepare for the industry 4.0 era that is being talked about today.

Focuses on maintaining students' identity, thinking, culture and identity in the face of the new National Development and Transformation Plan 2050. Students need to get out of the habit and master the 4C elements of Critical Thinking & Problem Solving, Communication, Collaboration and Creativity. 4C skills must be honed in every corner of life, in residential colleges, college halls, across volunteer and entrepreneurial activities. In preparation for the 4.0 industry challenges, university students need to consider the action.

One of the areas that should be emphasized in the 4C element is that students also need to prepare for the increasingly complex environment. 21st Century graduates must reinforce themselves in terms of some of the traits outlined in a student's superior skills, including: Emphasize complex problem solving skills, Improve oral, written communication skills, Embrace yourself as a leader and team member, Feel yourself with emotional intelligence as well as take advantage of all opportunities, always be creative.

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